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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/526,512

12/15/2005

Hans Kristian Kotlar

04150.0020U1

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01/07/2009

Ballard Spahr Andrews & Ingersoll, LLP

SUITE 1000

999 PEACHTREE STREET

ATLANTA, GA 30309-3915

EXAMINER

KAPUSHOC, STEPHEN THOMAS

ART UNIT

PAPER NUMBER

1634

MAIL DATE

DELIVERY MODE

01/07/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/526,512

Applicant(s)

KOTLAR ET AL.

Examiner

Stephen Kapushoc

Art Unit

1634

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 17-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date 2/6/06; 8/9/06
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-24 are pending.

Claims 17-24 are withdrawn from examination as detailed below.

Claims 1-16 are examined on the merits.

Election/Restrictions

1. Applicant's election of Group 1 (claims 1-16) and the particular probe of SEQ ID NO: 1 in the reply filed on 06/27/08 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 17-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 06/27/2008.

Claim Objections

3. Claim 3 is objected to because of the following informalities:

Claim 3 recites the phrase 'a oil/water mixture' where the phrase 'an oil/water mixture' is appropriate.

Appropriate correction is required.

Claim 16 is objected to over recitation of non-elected subject matter in the alternative. Applicants have elected for the examination of claims as they require SEQ ID NO: 1. Claim 16 encompasses any combination of SEQ ID NOs: 1-16, including

non-elected combinations requiring SEQ ID NO: 1, and combination not-requiring the elected SEQ ID NO: 1. It is noted that no claim is found allowable in this Office Action. Prior to the allowance of the objected to claim, any non-elected subject matter that has not been rejoined with the elected subject matter will be required to be removed from the claim.

Claim Rejections - 35 USC § 112 2nd ¶ - Indefiniteness

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 1-11, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-11, 15 and 16 are unclear over the stated purpose of the claimed methods of 'detecting, characterising or monitoring a hydrocarbon zone', as recited in the preamble of claim 1. Claim one has the single method step of 'the genotypic analysis of a sample for the presence of one or more thermophilic or extremophilic microorganisms'. However, a 'genotypic analysis' does not a priori result in detecting, characterising or monitoring'. As such there is not a nexus between the single method step and the purpose of the method as stated in the preamble of the independent claim, and it is not clear how the purpose of the method is accomplished.

Claim 11 is unclear over recitation of the limitation 'the nucleic acid within the sample', because there is not proper antecedent basis for any 'nucleic acid within the

sample' in either claim 11, or claim 1 from which the rejected claim depends. See MPEP 2173.05(e).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-12 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Orphan et al (2000) (citation A13 on the IDS of 02/06/2006).

Regarding claim 1, Orphan et al teaches a genotypic analysis of a sample and detecting the presence of thermophilic microorganisms (e.g.: p.700 – Abstract; p.701 – Construction and screening of 16S rDNA libraries; Cloning).

Regarding claims 2-4, Orphan et al teaches analyses of samples from production wellheads that originate from a sub-surface formation (claim 2), an oil/water mixture comprising oil and water exposed to oil (claims (3 and 4) (e.g. p.701 – Site description and reservoir conditions; Nucleic acid extraction).

Regarding claim 5, Orphan et al teaches creating information regarding microorganisms present in an ongoing production process (e.g.: p.701 – Site description and reservoir conditions; Fig 1). It is noted that the claim does not set forth any particular methods steps required for the information to be 'utilised' in the process, as

such the methods of generating the information are considered utilization of the information.

Regarding claims 6 and 7, Orphan et al teaches detecting a plurality of microorganisms to generate a sample profile (claim 6) and comparisons to reference profiles (e.g. p.705 – Comparison between 16S rDNAs from isolates to those directly recovered in libraries).

Regarding claim 8, Orphan et al teaches using primers to generate archaeal libraries and universal libraries (p.701 – Construction and screening of 16S rDNA libraries), where such methods are suitable for the analysis of the presence of the organismal genera recited in claim 8.

Regarding claim 9, Orphan et al teaches methods of analysis which do not require a culturing step (p.701 – Construction and screening of 16S rDNA libraries).

Regarding claims 10 and 11, Orphan et al teaches creating libraries of PCR amplified 16S rDNA sequences (p.701 – Construction and screening of 16S rDNA libraries), which is a method in which the sample is contacted with one or more different oligonucleotides designed to hybridize to regions of nucleic acid from the microorganisms.

Regarding claim 12, Orphan et al teaches the analysis of sample from the Miocene Monterey formation, which is a hydrocarbon zone that is characterized such that information about the sulphur content of the oil is obtained (e.g. p.708, left col., lns.5-10).

Regarding claim 15, Orphan et al teaches analysis of an oil reservoir (p. 701 – Sire description and reservoir conditions).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Orphan et al (2000) (citation A13 on the IDS of 02/06/2006) in view of Blume et al (2002).

Orphan et al teaches a genotypic analysis of a sample and detecting the presence of thermophilic microorganisms. Furthermore Orphan et al teaches the analysis of samples originating from different oil reservoirs with different depths and the detection of different microorganisms in the different samples (e.g. Table 1). Orphan et al does not specifically teach that different microorganisms are indicative of certain depths.

However, the association of particular microbial profiles with different particular geological depths was well known in the art at the time the invention was made.

Blume et al teaches the analysis of microbial community structure as a function of sample depth (e.g.: p.173 – Microbial biomass and microbial diversity; p.176 – Microbial community structure).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have performed an association analysis between detected microorganisms and depth, as taught by Blume et al, in the analysis of microorganisms detected in oil reservoir production fluids as performed by Orphan et al. One would have been motivated to perform an association analysis between detected microorganisms and depth based on the teaching of Orphan et al that different type of organisms are identified in samples originating from sources from different depths (Table 1).

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Orphan et al (2000) (citation A13 on the IDS of 02/06/2006) in view of Rawat et al (1994) (citation A14 on the IDS of 02/06/2006).

Orphan et al teaches a genotypic analysis of a sample and detecting the presence of thermophilic microorganisms. Furthermore Orphan et al teaches the analysis of samples originating from different oil reservoirs with different depths and the detection of different microorganisms in the different samples (e.g. Table 1). Orphan et al does not specifically teach that the migration route of a hydrocarbon zone is determined.

However, the analysis of hydrocarbon zone migration routes was well known in the art at the time the invention was made.

Rawat et al teaches the geo-microbial methods may be used for the exploration for hydrocarbons.

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the methods of Orphan et al in an analysis of hydrocarbon zone migration routes. One would have been motivated to do so based on the teachings of Rawat et al that geo-microbial methods may be used to explore for hydrocarbons, and the results of Orphan et al that particular microorganism profiles are indicative of fluids obtained from hydrocarbon reservoirs.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Orphan et al (2000) (citation A13 on the IDS of 02/06/2006) in view of Muyzer et al (1993).

Orphan et al teaches a genotypic analysis of a sample and detecting the presence of thermophilic microorganisms. Furthermore Orphan et al teaches the analysis of samples originating from different oil reservoirs with different depths and the detection of different microorganisms in the different samples (e.g. Table 1). Orphan et al does not specifically teach an analysis performed using SEQ ID NO: 1 (as consonant with the Election).

However, methods for the analysis of microbial populations were well known in the art at the time the invention was made, including methods comprising the use of a probe with the sequence of SEQ ID NO: 1.

Muyzer et al teaches methods for the amplification of 16s rDNA sequences from mixed populations of microbes, including methods using a probe with the sequence set forth in SEQ ID NO: 1 (i.e. the sequence of 'primer 1' (p.696 - PCR) of Muyzer et al is identical to SEQ ID NO: 1 of the instant application).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have used the primer according to Muyzer et al in the analysis of samples as performed by Orphan et al. Such a combination of methods would be the simple substitution by an element known in the prior art where the primer as used in Muyzer et al would be used in the same method of amplification as taught in Orphan et al. One would have been motivated to use the primer of Muyzer et al to provide additional alternative reagents and methods, where Muyzer et al teaches the successful use of the reagents and methods.

Conclusion

14. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Kapushoc whose telephone number is 571-272-3312. The examiner can normally be reached on Monday through Friday, from 8am until 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached at 571-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

/Stephen Kapushoc/
Art Unit 1634